

Amendments to the Claims

This listing of claims will replace the originally filed claims in the application.

Listing of Claims:

Claims 1 – 8 (cancelled)

Claim 9 (new): A method for producing carbon monoxide by cryogenic distillation comprising the following steps:

- a) a gas mixture containing carbon monoxide, hydrogen and nitrogen is cooled and partially condensed to produce a cooled and partially condensed gas mixture;
- b) the cooled and partially condensed gas mixture is separated to produce a hydrogen-enriched gas and a carbon monoxide-enriched liquid;
- c) a stream of the carbon monoxide-enriched liquid is sent to a stripping column to produce hydrogen-free liquid carbon monoxide and hydrogen-enriched carbon monoxide gas;
- d) a stream of the hydrogen-free carbon monoxide is sent to a first intermediate level of a distillation column;
- e) a liquid stream, richer in methane compared to the stream feeding to the distillation column, is withdrawn from the bottom of the distillation column;
- f) a carbon monoxide-rich stream is withdrawn from a second intermediate point, the second intermediate point being above the first intermediate point; and
- g) a stream, enriched with nitrogen and optionally hydrogen compared to the stream feeding to the distillation column, is withdrawn from the top of the distillation column.

Claim 10 (new): The method of claim 9, in which the carbon monoxide-rich stream withdrawn from the distillation column is a liquid stream.

Claim 11 (new): The method of claim 9, in which a carbon monoxide cycle cools the top of the distillation column and/or heats the bottom of the distillation column and/or heats the bottom of the stripping column.

Claim 12 (new): The method of claim 9, in which cycle carbon monoxide is expanded in a turbine.

Claim 13 (new): An installation for producing carbon monoxide by cryogenic distillation comprising:

- a) a heat exchanger for cooling and partially condensing a gas mixture containing carbon monoxide, hydrogen and nitrogen to produce a cooled and partially condensed gas mixture;
- b) a separator for separating the cooled and partially condensed gas mixture to produce a hydrogen-enriched gas and a carbon monoxide-enriched liquid;
- c) means for conveying the cooled and partially condensed gas mixture from the heat exchanger to the separator;
- d) a stripping column and means for conveying at least part of the carbon monoxide-enriched liquid thereto;
- e) means for withdrawing a hydrogen-enriched gas from the top of the stripping column and means for withdrawing a hydrogen-free liquid from the bottom of the stripping column; and
- f) a distillation column, means for sending a stream of the hydrogen-free liquid to a first intermediate point of the distillation column, means for withdrawing a bottom liquid from the distillation column, means for withdrawing an overhead gas (RSD N₂) from the distillation column and means for withdrawing an intermediate fluid at a second intermediate point of the distillation column, the second intermediate point being above the first intermediate point.

Claim 14 (new): The installation of claim 13, in which the distillation column has a top condenser and/or a bottom reboiler.

Claim 15 (new): The installation of claim 13, in which the stripping column has a bottom reboiler.

Claim 16 (new): The installation of claim 13, in which the column (columns) is (are) heated and/or cooled using a carbon monoxide gas cycle.